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ABSTRACT

A multidimensional inventory was developed to assess competitiveness as the desire to approach and strive for success in sport situations. A 32-item inventory was administered in two separate studies to samples of male and female students enrolled in competitive and non-competitive skills classes (n=237 in Study 1; n=218 in Study 2). Factor analyses revealed consistent three-factor solutions across studies, with the factors representing competitiveness (e.g., enjoyment of competition, striving for success in competition), win orientation (e.g., striving to win in competition), and personal goal orientation (e.g., striving to reach personal standards in competition). Alpha coefficients and item-to-total correlations revealed high internal consistency for each factor. Furthermore, students in competitive classes had significantly higher competitiveness scores than students in non-competitive skills classes, providing initial support for the validity of the inventory. The factor stability, internal consistency and initial validity evidence suggest that the Sport Competitiveness Inventory can be a valuable instrument for assessing competitiveness as a multidimensional, sport-specific individual difference variable. Appendices include the Competitiveness Inventory Items and the Sport Orientation Questionnaire. (Author/JD)

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Initial Development of a Multidimensional, Sport-Specific Competitiveness Inventory

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Abstract

A multidimensional inventory was developed to assess competitiveness as the desire to approach and strive for success in sport situations. An initial pool of 58 items representing competitiveness and achievement orientation in sport was circulated among five raters who rated each item for content and clarity. The resulting 32-item inventory was administered in two separate studies to samples of male and female students enrolled in competitive and noncompetitive skills classes (n = 237 in Study 1; n = 218 in Study 2). Factor analyses, described in an accompanying paper, revealed consistent three-factor solutions across studies, with the factors representing competitiveness (e.g., enjoyment of competition, striving for success in competition), win orientation (e.g., striving to win in competition), and personal goal orientation (e.g., striving to reach personal standards in competition). Alpha coefficients and item-to-total correlations revealed high internal consistency for each factor. Furthermore, students in competitive classes had significantly higher competitiveness scores than students in noncompetitive skills classes, providing initial support for the validity of the inventory. The factor stability, internal consistency and initial validity evidence suggest that the Sport Competitiveness Inventory can be a valuable instrument for assessing competitiveness as a multidimensional, sport-specific individual difference variable.

This presentation and the accompanying paper (Deeter & Gill, 1986) provide the first report of a long-term project on achievement orientation in sport, and specifically on the development of a multidimensional, sport-specific Competitiveness Inventory.

One of the most significant trends in current sport psychology research is the recognition of the need to consider the unique aspects of sport in our theoretical and empirical work. Martens' work on competitive anxiety and his development of the Sport Competition Anxiety Test (SCAT; Martens, 1977) illustrated the superiority of a sport-specific measure of trait anxiety, and the use of that scale has advanced our understanding of anxiety in sport situations. Similarly, others have found that the development and use of sport-specific measures in such areas as cohesiveness, confidence, state anxiety and intrinsic-extrinsic motivation provides greater insight into sport and exercise behavior than more general measures. Thus, the first major consideration in the development of the Competitiveness Inventory was that the measure be sport-specific.

The second major consideration was that the measure <u>not</u> be restricted to one dimension. Considerable work on general achievement motivation, particularly the work of Janet Spence and Robert Helmreich, (Helmreich & Spence, 1978; Spence & Helmreich, 1978) indicates that achievement motivation is a more diffuse construct than some individual difference characteristics, such as trait anxiety, and that achievement motivation is best measured as a multidimensional construct. I was not trying to develop a scale specifically for athletes. Instead, I wanted a measure that would tap different aspects of sport achievement motivation and that would be appropriate for athletes and nonathletes, for males and females, and for individuals in varied competitive and noncompetitive sport activities.

Keeping the goals of developing a sport-specific, multidimensional measure in mind, the first step was to generate items. I had been considering the competitiveness measure for some time before beginning this formal work, and had collected items. Some items came from the sport and achievement motivation literature. Some items were appropriated from Rainer Martens, who had begun work on a competitiveness measure but later abandoned that project. I also collected open-ended responses from sport participants in several exploratory projects, and students in a graduate seminar generated items. These strategies yielded 58 items, which were then circulated to five raters, all graduate students in sport psychology, who rated each item on content and clarity. Only items that were rated as definitely clear and definitely representative of sport achievement motivation by all five raters were retained, resulting in the 32 items that were then put into the initial Sport Competitiveness Inventory.

I adopted the format used by Helmriech and Spence in the Work and Family Orientation Questionnaire, their multidimensional achievement motivation measure. Each item was rated on a 5-point scale from strongly agree to strongly disagree. The 32 items are listed in Appendix A, and the actual format is shown in Appendix B, which prints the revised 25-item Sport Competitiveness Inventory that we are now using. The original 32-item inventory was administered to 10 pilot individuals who were asked to note any unclear or ambiguous items. No one reported any unclear or ambiguous items or offered any suggestions.

Now we have the inventory we're ready to administer it and begin psychometric analyses. To get a large sample we sampled skills classes at the University of Iowa. Skills classes are required of all Liberal Arts students, and 90% of our undergraduates start in the college of Liberal Arts (including pre-law, pre-medicine, pre-business, pre-computer science

and so on) so the sample is fairly representative of undergraduates. Students elect their specific classes from a wide choice, though, and we sampled selected classes to include both competitive activities (specifically softball, tennis, volleyball, fencing) and noncompetitive activities (archery, bowling, jogging, aerobics, fitness swim). In our first sample (from 1984) we had more females than males and more students in noncompetitive classes than competitive classes, but these differences were proportional. Our second sample (from 1985) was a replication of the first study, but we had problems with the distribution. Most males were in competitive classes, and most females in noncompetitive classes. This confounding of gender and activity class creates analysis and interpretation problems, and thus I will place less emphasis on these group differences later.

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insert Table 1 about here

The first step in our analysis was to investigate the factor structure--to determine if we had a unidimensional or multidimensional measure, and if we had a multidimensional measure, to determine the factor structure. Those analyses are described in the accompanying paper (Deeter & Gill, 1986).

The factor analyses yielded a 3-factor inventory and the three factors seem conceptually logical and psychometrically consistent. We have labelled them as competitiveness (which reflects a basic achievement orientation to enter and strive for success in competitive sport), and as a win and goal orientation (these two factors seem to reflect a focus on either interpersonal comparisons or personal goals).

Before discussing group differences on these three scores, I want to mention reliability. We calculated internal consistency coefficients for each scale for each sample, as shown in Table 2.

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insert Table 2 about here

All alpha coefficients were acceptably high, especially for the competitiveness scale. You may note that the number of items changes from Sample 1 to Sample 2. For the competitiveness scale I had originally eliminated one item even though its factor weight was over .50, but I later decided to retain that item. For Sample 2 the alpha was calculated both with and without the item, and was slightly higher with the item, so we now use 13 items in the revised inventory. The win scale calculations for sample 1 include 2 reverse-scored items. These items did have factor weights over .50, but using all 8 items yielded a lower alpha coefficient than just using the 6 items, and the item-total correlations for these two items were substantially lower than all others. Also, I don't like reverse wording and scoring for inventory consistency - so the two reverse-scored items were dropped from the revised inventory.

We also have an assessment of reliability or consistency over time. With sample 2 we went back to the skills classes at the middle of the course, after 4 weeks, and re-administered the Competitiveness Inventory. 205 of the original 218 in the sample re-took the inventory and all test-retest correlations indicate good reliability over time.

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insert Table 3 about here

Now, with some faith that we have reliable scores, I want to consider group differences on competitiveness, win and goal orientation.

The basic design was a Gender X Activity class (2 x 2) MANOVA. Along with the Sport Competitiveness Inventory, we administered Helmreich and Spence's WOFO questionnaire, and thus did two separate MANOVAs for each sample--one on the three Sport Competitiveness Inventory scores, and the second on the four WOFO scores, which are mastery (the desire for challenge), work (the desire to work hard), competitiveness (desire to do well in interpersonal competitition) and personal unconcern (which is similar to fear of success and is a lack of concern for the negative reaction of others to success). Generally personal unconcern is not very useful for Spence and Helmreich, and it's not very useful for us either.

First, let's look at the analyses of the four WOFO scores for Sample 1. Overall, we found Gender differences, but no Activity class differences or interactions.

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insert Table 4 about here

Table 4 illustrates where those gender differences occur. The most notable difference is on competitiveness - males score considerably higher than females. Females score higher than males on work. This replicates Spence and Helmreich's work, as they typically find the largest gender differences on competitiveness with females higher on work; they also find males higher on mastery, but that was not significant for our sample.

I am more interested in the differences on the Sport Competitiveness Inventory, and those findings were more interesting anyway. We found both Gender differences and Activity class differences, but no interactions.

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insert Table 5 about here

Gender differences were evident for all three scales, and as you can see in Table 5, the strongest difference was for win orientation--males were much higher. Males were also higher on competitiveness, but this was the least discriminating factor of the three. (Even though you see a 4-point difference, the scale has more items and a larger standard deviation.) Males then were clearly higher on win orientation and females were higher on goal orientation. You might also note that the multivariate gender difference was stronger than the multivariate difference for the four WOFO scores.

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insert Table 6 about here

Now I want to turn to the Activity class differences. The most important thing to note is that the difference is almost entirely on the competitiveness score, and it's a very strong difference; students in competitive classes score higher than students in noncompetitive classes. You will also note that this is a very different pattern from the gender differences.

Now I will go through the Sample 2 results, and I will do that quickly for two reasons. First, they generally replicate the sample 1 results (which a replication study should do), but also, we have the problem of confounding of gender and activity class that would lead you to place less faith in these observed differences anyway.

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insert Table 7 about here

Gender differences on WOFO scores were similar to those of Sample 1. Males were higher on competitiveness and females higher on work, although the work difference is nonsignificant here.

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insert Table 8 about here

Gender differences on the Competitiveness Inventory were slightly different from those of Sample 1. Males were higher on win orientation and competitiveness and females higher on goal orientation, but the gender difference on competitiveness here is stronger than in Sample 1.

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insert Table 9 about here

The Activity class difference was very similar to Sample 1. Again, competitiveness is the strongest discriminating factor. Students in competitive classes also were slightly higher on win orientation, and classes did not differ on goal orientation.

To summarize the group comparison results--First, WOFO findings replicate earlier work; males score higher on competitiveness, and there are marginal differences on work and mastery. Notably, no activity class differences were found, which may be logical because there is no reason why a general achievement motivation measure should separate competitive and noncompetitive classes. It is somewhat surprising that even the WOFO competitiveness scale did not differentiate classes.

Turning to Gender differences on the Sport Competitiveness Inventory--males were higher on competitiveness and win orientation, especially on win orientation, and females were higher on goal orientation. Perhaps Helmreich and Spence's competitiveness scale taps win orientation as much as, or more than, competitiveness per se. Also, the findings suggest that females are oriented to achievement in sport, even to competitive sport, but within competitive sport they are more focused on personal goals and less on interpersonal winning than males are.

Notably, competitiveness was the strongest discriminator between competitive and noncompetitive classes, suggesting that competitiveness influences the choice of activity. This provides good initial evidence for the validity of the Sport Competitiveness Inventory; a sport-specific measure of achievement orientation differentiated those who enroll in competitive classes from those in noncompetitive classes when a general measure did not.

At this point, I believe the sport-specific, multidimensional Competitive Inventory will be a valuable research tool. The factor structure seems sound and the three factors are conceptually logical. We have evidence showing good reliability of the three scales and initial evidence for its validity. The sport-specific measure differentiates students who choose competitive and noncompetitive skills classes. Further, the Sport Competitiveness Inventory reveals gender differences that may provide greater insight into the achievement choices and behaviors of females and males in sport activities than we have obtained using more general achievement measures.

We are continuing to work with the revised Sport Competitiveness Inventory, and I invite any of you who are interested to use the revised inventory in Appendix B.

References

Deeter, T.E., & Gill, D.L. (1986). Determining factor structure in a multidimensional inventory. Paper presented at the American Alliance for Health, Physical Education, Recreation and Dance National Convention, Cincinnati, April, 1986.

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Martens, R. (1977). Sport Competition Anxiety Test. Champaign, IL: Human Kinetics.

Spence, J.T., & Helmreich, R.L. (1978). Masculinity and Femininity: Their psychological dimensions, correlates and antecedents. Austin: University of Texas Press.

Table 1

Sample Characteristics

	Sample 1 (1984) (n = 237)		Sample 2 (1985) (n = 218)	
	Males	Females	Males	Females
Comp.	33	64	77	24
NonComp.	40	100	33	84

Table 2

Internal Consistency

Sample 1

Factor	Alpha	n of Items	Item - total *r* range
Comp	.94	12	.71 - .81
Win	.85	8	.37 - .68
Goal	.80	6	.46 - .70

Sample 2

Comp	.84	13	.61 - .80
Win	.86	6	.58 - .71
Goal	.79	6	.45 - .66

Table 3

Test-Retest Reliability Over 4 Weeks
Sample 2 (n = 205)

Factor	r
Comp	.89
Win	.82
Goal	.73

Table 4

Gender Differences on WOFO Scores
Sample 1

WOFO Scale	M for Males	M for Females	Univ. F	p	Disc. Coeff.
Mastery	20.14	19.88	.15	n.s.	-.20
Work	20.77	21.48	4.37	.05	.67
Comp	14.19	12.63	9.57	.01	-.78
Pers	9.10	9.32	.39	n.s.	.08

F (4, 230) = 3.82, p <.01

Table 5

Gender Differences on Competitive Scores
Sample 1

Comp Scale	M for Males	M for Females	Univ. F	p	Disc. Coeff.
Comp	49.67	45.60	6.06	.05	-.21
Win	24.52	20.18	27.62	.001	-.77
Goal	24.52	25.90	8.61	.01	.62

F (3, 231) = 13.69, p <.001

Table 6

Activity Class Differences on Competitiveness Scores
Sample 1

Comp Score	*M* for Comp	*M* for NonComp	Univ. *F*	*p*	Disc. Coeff.
Comp	50.25	44.50	16.36	.001	1.27
Win	21.70	21.23	.44	n.s.	-.50
Goal	25.26	25.63	.72	n.s.	-.60

F (3, 231) = 9.58, $p<.001$

Table 7

Gender Differences on WOFO Scores
Sample 2

WOFO Scale	M for Males	M for Females	Univ. F	p	Disc. Coeff.
Mastery	28.6	28.1	.88	n.s.	-.34
Work	27.3	28.0	3.29	.08	.80
Comp	19.3	17.8	8.14	.01	-.78
Pers	13.2	13.3	.03	n.s.	-.19

F (4, 211) = 3.84, $p<.01$)

Table 8

Gender Differences on Competitiveness Scores
Sample 2

WOFO Scale	*M* for Males	*M* for Females	Univ. *F*	*p*	Disc. Coeff.
Comp	52.7	45.6	25.16	.001	-.95
Win	20.3	17.4	15.03	.001	-.34
Goal	25.5	25.9	.50	n.s.	.67

F (3, 212) = 14.15, $p<.001$

Table 9

Activity Class Differences on Competitiveness Scores
Sample 2

Comp Score	M for Comp	M for NonComp	Univ. F	p	Disc. Coeff.
Comp	51.0	47.4	27.45	.001	-1.13
Win	19.0	18.7	6.23	.02	-.05
Goal	25.6	25.8	.43	n.s.	.68

F (3, 212) = 13.84, $p<.001$

Appendices

Appendix A lists the 32 items included in the original Sport Competitiveness Inventory

Appendix B is the revised and current version of the Sport Competitiveness Inventory

Note: the revised Sport Competitiveness Inventory yields three scores: Competitiveness, Win orientation and Goal orientation. Each item is scored from 1 to 5 (A=5, B=4, C=3, D=2, E=1), and the three scores are obtained by summing responses to the following items:

Competitivenessss - Sum items 1,3,5,7,9,11,13,15,17,19,21,23,25
Win orientation - Sum items 2,6,10,14,18,22
Goal orientation - Sum items 4,8,12,16,20,24

Competitiveness Inventory Items

1. I am a competitive person.
2. I try my hardest to win.
3. I am a determined competitor.
4. I want to be the best every time I compete.
5. I set goals for myself when I compete.
6. I look forward to competing.
7. I thrive on competition.
8. My goal is to be the best athlete possible.
9. I like to show others that I am skilled.
10. I am most competitive when I try to achieve personal goals.
11. I enjoy competing against others.
12. Winning is important.
13. I want to be successful in sports.
14. I am determined to do my best every time I compete.
15. I work hard to be successful in sports.
16. I feel great when I win.
17. I never give up, even when I'm losing.
18. The best test of my ability is competing against others.
19. Finishing the race is more important than winning.
20. I like to show others that I try hard.
21. I try hardest when I have a specific goal.
22. Reaching personal performance goals is very important to me.
23. Knowing that I performed well is a greater reward than the actual win.
24. The best way to determine my ability is to set a goal and try to reach it.
25. Scoring more points than my opponent is very important to me.
26. I hate to lose.
27. The only time I am satisfied is when I win.
28. Performing to the best of my ability is very important to me.
29. I look forward to the opportunity to test my skills in competition.
30. Losing upsets me.
31. I perform my best when I am competing.
32. I have the most fun when I win.

Sport Orientation Questionnaire - Form B

The following statements describe reactions to sport situations. We want to know how you usually feel about sports and competition. Read each statement and circle the letter that indicates how much you agree or disagree with each statement on the scale: A, B, C, D or E. There are no right or wrong answers; simply answer as you honestly feel. Do not spend too much time on any one statement. Remember, choose the letter which describes how you usually feel about sports and competition.

	Strongly agree	Slightly agree	Neither agree nor disagree	Slightly disagree	Strongly disagree
1. I am a determined competitor.	A	B	C	D	E
2. Winning is important.	A	B	C	D	E
3. I am a competitive person.	A	B	C	D	E
4. I set goals for myself when I compete.	A	B	C	D	E
5. I try my hardest to win.	A	B	C	D	E
6. Scoring more points than my opponent is very important to me.	A	B	C	D	E
7. I look forward to competing.	A	B	C	D	E
8. I am most competitive when I try to achieve personal goals.	A	B	C	D	E
9. I enjoy competing against others.	A	B	C	D	E
10. I hate to lose.	A	B	C	D	E
11. I thrive on competition.	A	B	C	D	E
12. I try hardest when I have a specific goal.	A	B	C	D	E
13. My goal is to be the best athlete possible.	A	B	C	D	E
14. The only time I am satisfied is when I win.	A	B	C	D	E
15. I want to be successful in sports.	A	B	C	D	E
16. Performing to the best of my ability is very important to me.	A	B	C	D	E
17. I work hard to be successful in sports.	A	B	C	D	E
18. Losing upsets me.	A	B	C	D	E
19. The best test of my ability is competing against others.	A	B	C	D	E
20. Reaching personal performance goals is very important to me.	A	B	C	D	E
21. I look forward to the opportunity to test my skills in competition.	A	B	C	D	E
22. I have the most fun when I win.	A	B	C	D	E
23. I perform my best when I am competing against an opponent.	A	B	C	D	E
24. The best way to determine my ability is to set a goal and try to reach it.	A	B	C	D	E
25. I want to be the best every time I compete.	A	B	C	D	E